

1) therefore, the resin gains fluidity to flow up to the edges. By making the thermosetting resin have a volume greater than the volume of a space between the IC chip 1 and the circuit board, the resin flows so as to ooze out of this space, thereby enabling the encapsulating effect to be produced. Subsequently, the heated tool 8 is moved up and the heat source is removed, thus abruptly reducing the temperatures of the IC chip 1 and the thermosetting resin sheet 6. Consequently, the thermosetting resin 6 loses its fluidity, and as shown in Fig. 1G and Fig. 3C, the IC chip 1 is fixed on the circuit board 4 by the hardened thermosetting resin 6s. If the circuit board 4 is heated by the stage 9, then the temperature of the bonding tool 8 can be set lower.

IN THE CLAIMS:

2) Please amend claims 39, 52 and 58 as follows:

39. (Amended) A method of mounting an electronic component, said method comprising:

aligning in position bumps formed by wire-bonding on electrodes of said electronic component with electrodes of a circuit board, with interposition between said electrode component and said circuit board of insulative solid thermosetting resin;

hardening with heat said thermosetting resin interposed between said electronic component and said circuit board, while achieving mutual pressing between said electronic component and said circuit board at a pressure force of at least 20 gf per bump during leveling of said bumps and correcting of any warping of said circuit board, thereby bonding said electronic component and said circuit board together to achieve electrical connection between said mutual electrodes thereof; and

said hardening, said leveling and said correcting being achieved at approximately the same time.

Sub 127
52. (Twice Amended) A method of mounting an electronic component, said method comprising:

aligning in position electrodes of said electronic component with electrodes of a circuit board, with interposition between said electronic component and said circuit board of insulative solid thermosetting resin;

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hardening with heat said thermosetting resin interposed between said electronic component and said circuit board, while achieving mutual pressing between said electronic component and said circuit board during correcting of any warping of said circuit board, thereby bonding said electronic component and said circuit board together to achieve electrical connection between said mutual electrodes thereof;

wherein, prior to said aligning, said thermosetting resin, in the form of a solid thermosetting resin sheet having holes formed at positions corresponding to said electrodes of said circuit board and extending in a direction of extension of said electrodes, with particles being embedded and electrically continuous in said holes, said particles comprising resin balls having surfaces plated with gold, nickel particles, conductive particles made of silver, silver-palladium or gold, conductive paste, or gold balls, is applied to said electrodes of said circuit board by positional alignment, and said bonding is executed by said hardening said sheet by application of heat thereto while conducting said pressing by forcing said electronic component toward said circuit board; and

wherein each of said particles has a size greater than a thickness of a passivation film to be coated on at least said electrodes of said electronic component and smaller than a thickness of one of said electrodes of said circuit board, and said bonding further is executed by applying ultrasonic vibrations to said electronic component.

Sub 127
58. (Amended) An apparatus to mount an electronic component to a circuit board, said apparatus comprising:

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a positional alignment device to align in position bumps formed by wire-bonding on electrodes of the electronic component with electrodes of the circuit board, with interposition between the electronic component and the circuit board of insulative solid thermosetting resin;

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a heating device to harden with heat the thermosetting resin interposed between the electronic component and the circuit board; and

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a pressing device to achieve mutual pressing between the electronic component and the circuit board at a pressure force of at least 20 gf per bump during leveling of the bumps and correcting of any warping of the circuit board, thereby bonding the electronic component and the circuit board together to achieve electrical connection between the mutual electrodes thereof; and

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said heating device and said pressing device achieving the hardening of the thermosetting resin, the leveling of the bumps and the correcting of the warping at approximately the same time.

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Kindly add the following new claims 77-88:

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Sub 77. The method according to claim 39, further comprising correcting any warping of said electronic component at approximately the same time as hardening said thermosetting resin, leveling said bumps and correcting any warping of said circuit board.

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78. The method according to claim 39, wherein hardening said thermosetting resin comprises applying heat of from 140°C to 230°C for from about several seconds to twenty seconds.

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79. The method according to claim 39, wherein said circuit board is selected from the group consisting of a multilayer ceramic board, a glass cloth base epoxy copper clad laminate board, an aramid unwoven fabric board, a glass cloth base polyimide resin copper clad laminate board, and flexible printed circuit board.

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80. The apparatus according to claim 58, wherein said heating device and said pressing device are constructed and arranged to correct any warping of said electronic component at approximately the same time as hardening of said thermosetting resin, leveling of said bumps and correcting of any warping of said circuit board.

✓81. The apparatus according to claim 58, wherein said heating device is to harden said thermosetting resin by applying heat of from 140°C to 230°C for from about several seconds to twenty seconds.

✓82. The apparatus according to claim 58, wherein said circuit board is selected from the group consisting of a multilayer ceramic board, a glass cloth base epoxy copper clad laminate board, an aramid unwoven fabric board, a glass cloth base polyimide resin copper clad laminate board, and flexible printed circuit board.

✓83. The method according to claim 52, further comprising correcting any warping of said electronic component and leveling said bumps at approximately the same time as hardening said thermosetting resin and correcting any warping of said circuit board.

✓84. The method according to claim 52, wherein hardening said thermosetting resin comprises applying heat of from 140°C to 230°C for from about several seconds to twenty seconds.

✓85. The method according to claim 52, wherein said circuit board is selected from the group consisting of a multilayer ceramic board, a glass cloth base epoxy copper clad laminate board, an aramid unwoven fabric board, a glass cloth base polyimide resin copper clad laminate board, and flexible printed circuit board.

✓86. The method according to claim 39, wherein hardening with heat said thermosetting resin while achieving the mutual pressing between said electronic component and said circuit board, during correcting of any warping of said circuit board, results in softening of said thermosetting resin and said circuit board.

✓ 87. The apparatus according to claim 58, wherein said heating device and said pressing device are constructed and arranged to soften said thermosetting resin and said circuit board during correcting of any warping of said circuit board.

DS 88. The method according to claim 52, wherein hardening with heat said thermosetting resin while achieving the mutual pressing between said electronic component and said circuit board, during correcting of any warping of said circuit board, results in softening of said thermosetting resin and said circuit board.
